## Table 11. Percent of instrument systems deemed state-of-the-art for academic research, by detailed type of instrument and current age of instrument: 1993

[Percent of systems]



| Detailed type of instrument | Current age | | | | | |
|---|---|---|---|---|---|---|
| | Total deemed state-of-the-art | 0 - 2 years | 2 - 4 years | 4 - 6 years | 6 - 8 years | 8+ years |
| Total, all instruments[1] | 27% | 51% | 36% | 27% | 17% | 10% |
| Computers and data handling instruments | 14 | 44 | 17 | 3 | 2 | * |
| Computers/components costing: | | | | | | |
| $1,000,000 and over | 23 | S | S | 0 | 0 | 0 |
| $500,000 - $999,999 | 23 | S | 25 | 0 | 0 | S |
| $50,000 - $499,999 | 11 | 38 | 16 | 7 | 3 | * |
| $20,000 - $49,999 | 16 | 45 | 18 | 1 | 0 | 0 |
| Chromatographs and spectrometers | 28 | 56 | 47 | 30 | 21 | 6 |
| Chromatographs and elemental analyzers | 35 | 61 | 61 | 15 | 25 | 9 |
| Electron/auger/ion scattering | 23 | S | S | S | S | 0 |
| UV/visible/infrared spectrophotometer | 25 | 45 | 29 | 55 | 9 | 1 |
| NMR/EPR spectrometer | 14 | 42 | 47 | 8 | 21 | 1 |
| Xray diffraction systems | 33 | 62 | 43 | 44 | 27 | 3 |
| Other spectroscopy instruments | 28 | 61 | 39 | 31 | 23 | 11 |
| Microscopy instruments | 31 | 47 | 43 | 41 | 33 | 6 |
| Electron microscopes | 28 | 86 | 26 | 63 | 34 | 3 |
| Other microscopy instruments | 33 | 43 | 50 | 28 | 33 | 8 |
| Bioanalytical instruments | 27 | 64 | 34 | 31 | 18 | 10 |
| Cell sorters/counters, cytometers | 39 | S | S | S | S | 0 |
| Centrifuges and accessories | 28 | 60 | 39 | 30 | 13 | 13 |
| DNA/protein synthesizers/sequencers/ analyzers | 41 | 68 | 21 | 44 | 36 | 27 |
| Growth/environmental chambers | 30 | S | 48 | 55 | 2 | 7 |
| Scintillation/gamma radiation/counters/ detectors | 19 | 91 | 25 | 22 | 15 | 4 |
| Other instruments | 34 | 50 | 42 | 36 | 20 | 16 |
| Electronics instruments (cameras,etc) | 30 | 43 | 22 | 51 | 17 | 24 |
| Temperature/pressure control/ measurement instruments | 38 | 22 | 54 | 60 | 33 | 23 |
| Lasers and optical instruments | 27 | 49 | 24 | 27 | 7 | 9 |
| Robots, manufacturing machines | 54 | 82 | 14 | S | S | 6 |
| Telescopes/astronomical | 65 | S | 97 | 0 | 0 | 22 |
| Nuclear reactors/nuclear science instrument systems | 21 | 0 | S | S | S | 0 |
| Research vessels/planes/helicopters | 42 | 0 | S | S | S | 0 |
| Wind/wave/water/shock tunnels | S | 0 | 0 | 0 | 0 | S |
| Molecular/electron/ion beam systems | 50 | S | S | S | S | 17 |
| Major prototype systems | 59 | S | 80 | S | S | 33 |
| Other, not elsewhere classified | 31 | 46 | 44 | 31 | 21 | 15 |

[1] The questionnaire was worded: "State-of-the-art: the most highly developed and scientifically sophisticated equipment of its kind."

**NOTES:** Data in this table were not collected for supersystems, which are large, integrated instrumentation systems/facilities generally with an aggregate purchase price of $1 million or more.

The percents in this table are based on total responses per age group/instrument type.

**KEY:** * = less than 0.5 percent
S = fewer than 10 cases for analysis

**SOURCE:** National Science Foundation/SRS, Survey of Academic Research Instruments and Instrumentation Needs: 1993